

NEW AUSTRALIAN BEES IN THE COLLECTION OF
THE BRITISH MUSEUM.—II.

BY T. D. A. COCKERELL.

HALICTUS.

THE following species are black, the abdomen without hair-bands or patches. They are named after well-known Australian explorers:—

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| Mesothorax shining, with widely scattered punctures | 1. |
| Mesothorax dull, very closely or at least (<i>forresti</i>) rather closely punctured | 2. |
| 1. Very small; area of metathorax very finely and regularly longitudinally striate | <i>burkei</i> , Ckll., ♀. |
| Larger; area of metathorax irregularly longitudinally wrinkled | <i>sturti</i> , Ckll., ♀. |
| 2. Area of metathorax with very coarse vermiform ridges | <i>forresti</i> , Ckll., ♂. |
| Area of metathorax not so | 3. |
| 3. Most of clypeus yellow; size largest, length about 10 mm., male | <i>warburtoni</i> , Ckll. |
| Clypeus all black; size smaller, females | 4. |
| 4. Area of metathorax delicately irregularly reticulate | <i>mitchelli</i> , Ckll. |
| Area of metathorax finely striate with raised lines | 5. |
| 5. Second submarginal cell large, approximately square, except that the second t. c. slants inwards above | <i>leichardti</i> , Ckll. |
| Second submarginal cell narrower, much higher than broad | <i>willsi</i> , Ckll. |

The microscopic characters of these species are as follows:—

(1.) Front.

H. warburtoni.—At sides cribrately punctured, with very large shining punctures, covering the surface; but in middle, below the ocelli, dull, with a very feeble malleolar sculpture.

H. mitchelli.—Contiguously punctate all over, the lateral areas not so strongly as in *warburtoni*, and the median area distinctly and regularly, though the punctures are small.

H. burkei.—Dullish, with small but distinct punctures, which are moderately dense; the ground between them is roughened by little lines.

H. willsi.—Not unlike *burkei*, but punctures closer.

H. sturti.—General type of *willsi* and *burkei*, but punctures laterally becoming sparse and weak, and nowhere are they strong.

H. leichardti.—With close small punctures all over.

H. forresti.—With small and quite close, but by no means

contiguous, punctures; hair in middle line and around antennæ very beautifully plumose; hair at upper part of sides simple.

(2.) Mesothorax.

H. warburtoni. — With shallow but large and almost contiguous punctures all over; they are somewhat shiny, and the intervals are smooth. (The scutellum is also extremely densely and strongly punctured.)

H. mitchelli. — Strongly and closely, but not contiguously, punctate on a smooth ground; a few minute punctures interspersed. The interval between the punctures perhaps averages from half to three-quarters the width of a puncture, though in places it is more. (Scutellum has very small punctures, with a few larger ones interspersed; the punctures are mostly scattered, not dense.)

H. burkei. — Rather shining, minutely but very distinctly tessellate, with very distinct but very widely separated punctures.

H. willsi. — Rough, and contiguously punctured all over.

H. sturti. — With widely separated weak punctures, on a rather obscurely tessellate surface.

H. leichardti. — Obscurely tessellate, with rather close strong punctures all over, except that anteriorly the punctures become weaker and sparser.

H. forresti. — Minutely tessellate, with rather shallow fairly close punctures.

(3.) Second abdominal segment.

H. warburtoni. — Basal half well-punctured, on a microscopically tessellate surface; apically the punctures get smaller and much more distant, and the tessellation gives way to a transverse lineolation.

H. mitchelli. — With small regular punctures all over, averaging about as far apart as twice the diameter of one. Ground obscurely transversely lineolate. Hind edge of segment (as also of first) very narrowly light yellow (so narrowly that it is not readily noticed with a lens).

H. burkei. — Dullish, not punctate; the basal part minutely transversely lineolate.

H. willsi. — Minutely and densely, though not contiguously, punctured. The broad depressed apical part transversely lineolate, with minute widely-separated punctures.

H. sturti. — Obscurely lineolate, with only minute scattered hair-punctures. The subapical region has a row of depressed dark bristles.

H. leichardti. — Closely punctate, the punctures small but strong.

H. forresti. — Dullish, with very minute and quite sparse

punctures. Apical part minutely transversely lineolate, with very few punctures.

Halictus warburtoni, n. sp.

♂. Length about 10 mm.; black, the pubescence dull white, with some black or dark fuscous on vertex and dorsum of abdomen; inner orbital margins shallowly submarginate, converging below; clypeus with rather more than the anterior half light lemon-yellow, the yellow also sending a broad process upwards in the median line; antennæ long, black, the middle flagellar joints bulging beneath; area of metathorax short, shining, with irregular plicæ, bounded by a distinct rim; sides of metathorax covered with white tomentum; legs black, including tarsi; hair on inner side of tarsi slightly yellow; tegulæ large, punctate, dark rufous; stigma large, rather dark reddish, nervures fuscous; b. n. falling just short of t. m., with no interval between them; second s. m. approximately square; first r. n. meeting second t. c.; abdomen rather broad, convex, the hind margins of the segments very dark reddish. The scutellum is bigibbous, with a median depression.

Hab. Hobart, Tasmania (J. J. Walker, 3215). Not unlike *H. lanuginosus*, Sm., but, while the pubescence is of the same general type, it is much less abundant; the head, seen from in front, is broader and more triangular (in *lanuginosus* it is nearly round); the stigma is much larger; the area of metathorax is quite different, &c.

Halictus mitchelli, n. sp.

♀. Length not quite 9 mm.; black, so similar to *H. warburtoni* that at first I thought it might be its mate; but the microscopical characters dispose of this possibility, and the wings are also quite different, the stigma being smaller and yellower (a sort of dull amber), the nervures are lighter, and the first r. n. enters the second s. m. about the beginning of its last fourth. The scutellum is flattened, not bigibbose, and the area of metathorax has an irregular subreticulate pattern of raised lines.

Hab. Hobart, Tasmania (J. J. Walker, 3220). Easily known from *H. representans*, Sm., by the sculpture of metathorax, light stigma, &c.

Halictus burkei, n. sp.

♀. Length about 5 mm.; black, with the abdomen rufo-piceous; the head is dullish, but the mesothorax is very shiny, and when held near the window for examination reflects the blue sky so that one could easily be deceived into thinking it tinted; flagellum dull reddish beneath; area of metathorax dull, covered with very fine striæ; legs rufo-piceous or almost black, the knees redder; tegulæ pale testaceous, with a dark mark in front; wings iridescent; stigma very large, dull reddish brown; nervures light brown, the second r. n. and third t. c. barely discernible; b. n. falling some distance short of t. m.; second s. m. about twice as broad below as above, receiving the first r. n. at about the beginning of its last fourth; abdomen shining above, beneath with much white hair, in which pollen is collected.

Hab. Hobart, Tasmania (J. J. Walker, 3251).

Halictus willsi, n. sp.

♀. Length almost 6 mm.; black, with dull white pubescence; head broad; front and mesothorax appearing granular, hardly shining; flagellum dull brownish beneath; legs black, hairy; hind spur having a broad, strongly divergent, blunt tooth about the end of its first third, and beyond that only a single broad low rounded lamella; tegulæ shining dark rufous, not punctate; b. n. very strongly bent, and falling just short of t. m.; second s. m. higher than broad; first r. n. meeting second t. c.; second r. n. and third t. c. barely visible; stigma and nervures rufous; area of metathorax very finely striate; abdomen broad, dullish; venter with long erect white hair.

Hab. "New Holland," 44 . 4.

Halictus sturti, n. sp.

♀. Length a little over 6 mm.; black, broad, and robust, with scanty white pubescence; clypeus very shiny, with a few large punctures; front dullish; flagellum only very faintly brownish beneath; mesothorax shining, overlapping prothorax in front; post-scutellum with white tomentum; area of metathorax shining and irregularly wrinkled; legs dark rufo-piceous, hairy; hind spur with three little sharp teeth close together about the middle, but otherwise simple; the first of these teeth is shorter and more divergent than the other two; tegulæ large, piceous; wings iridescent, stigma and nervures dark rufo-piceous; b. n. falling a short distance short of t. m.; second s. m. narrowing above; first r. n. meeting second t. c.; second r. n. and third t. c. a little weakened, but very distinct; abdomen broad, shining, pitch-black, the hind margins of the segments as black as the rest.

Hab. Queensland (Gilbert Turner, 631).

Halictus leichardti, n. sp.

♀. About the same size and general appearance of *H. sturti*, but distinguished at once by the strongly fuscous tint of the wings, the broader face, the strongly and densely punctured mesothorax, and the equally densely though more finely punctured abdomen. Scape long, flagellum ferruginous beneath; front, vertex, and mesothorax with some short dark hair; tubercles covered with dull white tomentum; area of metathorax finely but rather irregularly striate, the striae not reaching its posterior edge; tegulæ rather large, piceous, punctured, though not all over; stigma and nervures dark reddish; b. n. falling some distance short of t. m.; second s. m. large, receiving the first r. n. at its apex; outer nervures as in *H. sturti*; legs dark, hairy, much of the hair dark; hind spur with two rows of very fine teeth, the inner edge bearing closely appressed, pale, sharp teeth, about eighteen in number, the hind edge with less numerous, rather larger, blunter, and darker teeth; the anterior spur has also the row of fine pale teeth, quite the same as on the other; abdomen broad.

Hab. Queensland (Gilbert Turner, 335, Hy.).

Halictus forresti, n. sp.

♂. Length about 6 mm.; black, the anterior half of the clypeus pale dull yellow, the yellow a little produced upwards in the middle line; face narrow; face and front with much short greyish-white hair; scape very short; flagellum extremely long, black; mesothorax dullish; upper edge of prothorax, and tubercles, with much white tomentum; post-scutellum with white tomentum; area of metathorax very coarsely irregularly wrinkled; tegulæ large, dark reddish, with a few minute punctures toward the base; wings clear, iridescent, stigma and nervures dark rufo-piceous; b. n. falling some distance short of t. m.; first r. n. meeting second t. c.; outer nervures distinct; legs black, tarsi dark reddish; abdomen entirely black, the hind margins of the segments shining.

Hab. Queensland (Gilbert Turner, 406, Hy.). Looks much like *H. sturti*, but cannot be its male, the sculpture being so different.

University of Colorado: Oct. 4th, 1905.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC HEMIPTERA OR RHYNCHOTA).

BY G. W. KIRKALDY.

(Continued from vol. xxxviii. p. 236.)

CYMATIA,* Flor.

Face excavated in the male, convex in the female. No apparent stridular area on anterior femora. Palæ in the male slender, elongate, subcylindric, inferiorly set with a few strong bristles, and terminated by a crooked knife-like claw. In the female the palæ are similar to those of the male, but lack the claw.

The habits are like those in the following genera. There are two British species, easily distinguished by their size, *bonsdorffii* being double that of *coleoptrata*. It is not likely that the other species will be found in Britain.

1. *C. BONSORFFII* (C. R. Sahlberg). Figured by Saunders and many others; the male palæ are figured by me (Quekett paper). Distributed probably over the greater part of the British Isles †; recorded from Srath glas to Woking, and from Norfolk to Harris. In Ireland, Mr. Halbert has taken it near Dublin. I have taken it freely in the Scottish Highlands and in Surrey, also in Brittany.

* Greek *kyma*, a wave.

† The detailed distribution of the British Aquatic Bugs will be given in an appendix.